

REMARKS

Claims 14-31 are pending. By this Amendment, the specification, Figures 1 and 4 and claims 14 and 16 have been amended and Figure 6 has been added. No new matter has been added.

I. The Drawings Satisfy All Formal Requirements

The drawings are objected to under 37 C.F.R. §1.83(a) for failing to show features of the invention. With regard to the mechanical bolt, having two positions, which is connected to a U-shaped key placed in constriction on the exterior of the housing, rotation of which allows the bolt to be placed in the desired position, Applicants have added Figure 6 which shows an exemplary embodiment of a circuit closing means, such as, for example, a mechanical bolt and U-shaped key responsive to the objection. Further, Applicants submit that one skilled in the art would know the structural features of a mechanical bolt and U-shaped key, as well as, any other structures/switches that can be used for the circuit closing means.

With regard to the subject matter disclosed on page 4, lines 17-21 of the specification regarding the firing means and the subject matter disclosed on page 4, lines 22-24 of the specification regarding the programming means, code wheels and a microcontroller, Applicants submit that code wheels (38), which are an exemplary embodiment of the programming means, are shown as a labeled box in Figure 3. Similarly, with regard to the subject matter disclosed on page 5, lines 3 and 4 regarding the switching means, Applicants submit that the switching means (34) is shown as a labeled box in Figure 2. Further, 37 C.F.R. §1.83(a) states that features disclosed in the description and claims, where their detail illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box). Applicants submit that one skilled in the art at the time of the invention would know what code wheels are and the exact shape of the code wheels is not

essential for the proper understanding of the claims. Similarly, Applicants submit that one skilled in the art at the time of the invention would know that there are various different structures/circuits which may be used as the switching means and the exact circuit/structure of the switching means is not essential for the proper understanding of the claims. Thus, Applicants submit that the labeled boxes to show the switching means and code wheels are adequate representations of the claimed features under 37 C.F.R. 1.83 and M.P.E.P. 608.02(d). It is respectfully requested that the objection to the drawings be withdrawn.

II. The Specification Satisfies All Formal Requirements

The specification is objected to for containing minor informalities. The Office Action states that it is unclear what "the means" on page 2, line 11 of the specification and "the means" on page 3, line 3 of the specification refers to. The Office Action also states that the word "housing" on page 7, line 7 of the specification lacks a reference number.

Applicants amended the specification to recite "timing means" on pages 2 and 3 of the specification and to include reference numeral 23, which refers to an exemplary illustration of a housing. In addition, Figures 1 and 4 have been amended to identify housing (23). It is respectfully requested that the objection to the specification be withdrawn.

III. The Claims Satisfy All Formal Requirements

Claims 14-29 are rejected under 35 U.S.C. §112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specific language in claims 14, 16, 19, 20 and 28 is identified as forming the basis for the rejection. The rejection is respectfully traversed.

With regard to the "power generating means" feature recited in claim 14, Applicants respectfully submit that a description of the power generating means can be found at least on page 6, lines 1-5 of Applicants' specification. The power generating means can be any means which is capable of generating a power sufficient to actuate the priming resistor. For example, page 6, lines 1-5 discloses that the power generating means includes a power supply

and a capacitor, which are capable of generating, upon expiration of the timing interval, the current sufficient to actuate the priming resistor. It is thus respectfully submitted that the specification does sufficiently describe the power generating means.

With regard to the "electrical power supply means" feature recited in claim 16, Applicants amended claim 16 responsive to the rejection.

With regard to "the timing means" feature recited in line 1 of claim 19, Applicants respectfully submit that antecedent basis for the feature can be found in line 2 of claim 16 which recites "means for timing". It is submitted that claim 19 depends from claim 17 and claim 17 depends from claim 16. It is thus respectfully submitted that there is sufficient antecedent basis for "the timing means" feature recited in claim 19.

With regard to "the microcontroller" feature recited in line 2 of claim 20, Applicants respectfully submit that antecedent basis for the feature can be found in line 2 of claim 17, which recites "the control means comprises a microcontroller." It is submitted that claim 20 depends from claim 19, which depends from claim 17. It is thus respectfully submitted that there is sufficient antecedent basis for "the microcontroller feature" recited in claim 20.

With regard to the "booby-trap means" recited in claim 28, Applicants submit that the language "for deliberately authorizing firing of the primer", which immediately follows the recitation of "booby-trap means" specifies the function of the "booby-trap means". It is thus respectfully submitted that claim 28 sufficiently specifies the function of "booby-trap means" feature recited in claim 28.

It is respectfully requested that the rejection of claims 14-29 under 35 U.S.C. §112, second paragraph, be withdrawn.

The additional features of the priming device recited in claim 21 have not been rejected over any art. Thus, Applicants submit that the additional features recited in claim 21 are allowable.

IV. The Claims Define Allowable Subject Matter

Claims 14-20, 22, 23, 25, 26 and 30 are rejected under 35 U.S.C. §102(b) over Jullian, U.S. Patent No. 5,014,622; claim 20 is rejected under 35 U.S.C. §103(a) over Jullian in view of Howell, U.S. Patent No. 5,899,553; and claim 24 is rejected under 35 U.S.C. §103(a) over Jullian in view of Jarrott et al. (hereinafter "Jarrott"), U.S. Patent No. 4,632,031. The rejections are respectfully traversed.

Applicants' invention pertains to a priming device for firing a detonator using an electrical power supply and power generating means. Resistors regulate the current intensity so that an undesirable or unexpected firing of the firing element is avoided when the transistors or electromechanical assembly downstream of the resistors fail. As a result, a misfiring is rendered unlikely, and safer more reliable firing of the firing element may be achieved even when an operator error has occurred during programming of a firing delay.

Applicants submit that Jullian does not disclose "power generating means for generating, through a resistive circuit and charged capacitor, a second power intensity sufficient to actuate the firing element upon expiration of a timing interval, wherein the timing means and power generating means have resistors limiting the current intensity, the first power intensity from the power supply not being sufficient, even as other components fail, to actuate the firing element" as recited in claim 14.

Further, Applicants submit that Jullian does not disclose "power generating means for generating, through a resistive circuit having resistors limiting current intensity, a current intensity sufficient to actuate the firing element upon expiration of a timing interval, the power generating means comprising a capacitor, switching means, and controlling means for controlling the switching means by allowing the capacitor to be charged for a charging time during the timing interval and then discharged, the discharge causing the firing element to act on the primer" as recited in claim 16.

Applicants submit that Jullian discloses a single timing means for determining when a time interval corresponding to the recorded blasting delay has expired following receipt of the blasting signal. Thus, the counter effectively counts through the recorded blasting delay (col. 2, lines 18-22). Jullian does not disclose an electronic circuit design using components, which can limit current intensity in case of power supply disturbances, hazardous phenomena (EMP-Neutrons-ESD), or countermeasures. EMP causes electronic circuits to become short-circuited. The present invention prevents the power supply from going straight to the exploding device when the electronic circuit is damaged (e.g., short-circuited) in order to increase safety. No early bursts can occur. However, as shown in Fig. 7 of Jullian, an EMP causes Q2, Q3, SCR and IC to become short-circuited and the bridge wire 128 will ignite the conventional explosive charge. The present invention limits current so that the explosive charge will not ignite.

In addition, to further increase safety, the firing capacitor is charged at the very last moment when firing. Therefore, there is no need to discharge the capacitor if the ignition order is cancelled. Jullian does not teach this feature.

In addition, Applicants submit that Howell and Jarrott do not overcome the deficiencies of Jullian as discussed above.

For at least these reasons, Applicants submit that Jullian, either alone or in combination with Howell and/or Jarrott, fails to disclose or suggest all the features of claims 14 and 16, as well as all the features of claims 15, 17-20, 22-26 and 30, which depend from claims 14 and 16. It is respectfully requested that the rejections be withdrawn.

Claims 16, 27-29 and 31 are rejected under 35 U.S.C. §102(b) over Boucher, U.S. Patent No. 5,476,044. The rejection is respectfully traversed.

Applicants submit that Boucher does not disclose "power generating means for generating, through a resistive circuit and charged capacitor, a second power intensity sufficient to actuate the firing element upon expiration of a timing interval, wherein the

timing means and power generating means have resistors limiting the current intensity, the first power intensity from the power supply not being sufficient, even as other components fail, to actuate the firing element" as recited in claim 14.

Further, Applicants submit that Boucher does not disclose " power generating means for generating, through a resistive circuit having resistors limiting current intensity, a current intensity sufficient to actuate the firing element upon expiration of a timing interval, power generating means comprising a capacitor, switching means, and controlling means for controlling the switching means by allowing the capacitor to be charged for a charging time during the timing interval and then discharged, the discharge causing the firing element to act on the primer" as recited in claim 16.

As discussed in the Request for Reconsideration filed on January 23, 2003, in contrast to Applicants' claim 16 which recites that a power generating means generates through a resistive circuit a current intensity sufficient to actuate the firing element upon expiration of a timing interval, the transformer (14) of Boucher, which serves as the high voltage power generating means, produces the high voltage power independently of the operation of timer (212). Further, in Boucher, not only does the transformer (14), serving as the high voltage power source, generate its power independently of the operation of the timer (212), the timer (212) actually uses and depends on the generated high voltage power outputted by the transformer (14) to operate (col. 5, lines 42-44 of Boucher).

Accordingly, Applicants submit that Boucher fails to disclose a priming device for a detonator, wherein the timing means comprises a first timing interval for timing a user-programmable interval and a second timing interval for timing a first pre-programmed interval for the switching means and a third timing interval for timing a second pre-programmed interval, as recited in claim 16.

For at least these reasons, Applicants submit that Boucher fails to disclose all the features of claim 16 as well as all the features of claims 27, 28, 29 and 31, which depend from claim 16. It is respectfully requested that the rejection be withdrawn.

V. Conclusion

For at least these reasons, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 14-31 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number set forth below.

Respectfully submitted,



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